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1,139,699



## PATENT SPECIFICATION

DRAWINGS ATTACHED

1,139,699

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## COMPLETE SPECIFICATION

## A Key Construction for Splining Steel Brake Discs to an Annular Wheel of Lightweight Metal

We, THE GOODYEAR TIRE & RUBBER COMPANY, a corporation organized under the laws of the State of Ohio, United States of America, of 1144 East Market Street, Akron, Ohio, United States of America do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a key construction for splining steel brake discs to an annular wheel of light metal, e.g. cast or forged magnesium.

Heretofore there have been various types and kinds of key combinations for mounting a steel brake disc or discs on a cast light metal airplane wheel. These keys are generally of steel and are secured to the cast wheel by screws thus forming threaded joints with dissimilar metals and associated corrosion and stress concentrated problems. In addition to the problems due to the dissimilar metals, the screw-on keys also require an additional number of parts, relatively close tolerances, greater assembly time, and with increased maintenance needed to keep the wheel assembly in working condition. The plurality of screw-on keys required around a wheel are heavy and do not allow for proper brake space within some wheels.

The main object of the present invention is to overcome the stated difficulties in the prior art by providing a better and less expensive key construction for splining steel brake discs to an annular wheel of light weight metal and wherein shell keys of steel are slipped over key bosses cast in the light metal wheel to provide long wear and strong surfaces.

Another object of the invention is the provision of simple means to lock each shell key to the cast key boss.

The present invention consists in a key construction for splining steel brake discs to an annular wheel of lightweight metal, said key con-

struction comprising a plurality of elongated key bosses integrally formed on said wheel extending longitudinally thereof at circumferentially spaced locations, a plurality of stamped sheet metal shell keys each substantially covering a said key boss to provide wear-resistant surfaces and means integral with each shell key to secure it in fixed relation to its associated key boss.

In the accompanying drawings:—

Figure 1 is a fragmentary cross sectional view of an airplane wheel and brake combination illustrating one embodiment of the invention;

Figure 2 is a broken away side elevational view of the cast wheel and key boss of Figure 1, and with the shell key shown in cross section; and

Figure 3 is a broken away plan view of Figure 2.

With particular reference to the drawings, the numeral 1 generally indicates a partially broken away annular wheel which is rotatably secured to an axle, (not shown in the drawing). The wheel is typically an airplane wheel cast from light metal such as magnesium or aluminium or alloys thereof. Projecting radially and directed longitudinally along the circumference of the wheel housing 1, are a plurality (only one shown) of circumferentially spaced elongated key bosses 2. In one best known form of the invention the key bosses 2 project radially inward from the inner circumference of the wheel or a flange thereof. The key bosses 2 are formed as an integral cast part of the wheel 1. As illustrated in Figure 1, each key boss 2 has an undercut form of substantially T-shape, or half block-I form in cross section. The purpose of such a particular form is to permit a sheet steel stamping 3 or shell key to be slidably received in complementary and surrounding relation by the key boss 2. The shell key 3 has substantially a U-shaped form in cross section with the edges thereof extending around the enlarged top and into

the undercuts of the key boss 2. The shell key 3 is generally made of a sheet steel or any other hard metal which provides a stronger surface with longer wear for splined engagement with a brake disc 4, partially broken away in Figure 1. The splined engagement of the brake disc 4 with the wheel 1 rotatably carries the parts with each other, but allows for axial movement of the disc on the wheel which is necessary during the braking action.

Referring to Figure 2, the elongated key boss 2 has a slot 5 cut therein, said slot being cut perpendicular to the elongated length of the key boss 2. The purpose of such a slot is to receive the bent tip 6 of an elongated spring clip 7 formed as an integral part of the top surface of the shell key 3. The spring clip 7 springs slightly out of the top plane of the key when the shell key 3 is slid longitudinally along the elongated length of the key boss 2 until it covers the entire top and sides of the key boss, whereupon the bent tip 6 of the spring clip 7 snaps into the slot 5 (see Fig. 2), locking the shell key 3 in fixed relation to the key boss 2.

Figure 3 is a plan view of Figure 2 illustrating the spring clip 7 of the shell key 3. The spring clip 7 permits the shell key to be quickly mounted on the key boss 2 and yet to be securely held against slippage with the key boss 2 during the use of the assembly. The spring clip 7 also permits the shell key 3 to be removed after long use and wear results, and the invention allows the inserting of a new shell key into relationship between the disc 4 and the key boss 2 in order to prolong the life of the wheel assembly. Thus, the life of any wheel assembly material is prolonged even though it may be titanium, for example. As distinct from the operation of the invention as described, conventional keys are too often treated as a permanent installation due to the fact that they are not easily removed.

#### WHAT WE CLAIM IS:—

1. A key construction for splining steel brake discs to an annular wheel of light weight metal, said key construction comprising a plurality of elongated key bosses integrally formed on said wheel extending longitudinally thereof at circumferentially spaced locations, a plurality of stamped sheet metal shell keys each substantially covering a said key boss to provide wear-resistant surfaces and means integral with each shell key to secure it in fixed relation to its associated key boss.

2. A key construction as claimed in claim 1, wherein each key boss projects radially inwardly from the inner circumference of the wheel and has an undercut form in cross section which is engaged by the sides of the shell key, a slot being cut perpendicular to the length of the key boss.

3. A key construction as claimed in claim 2, wherein the means to secure the shell key to the key boss is an elongated spring clip integral with the top surface of the shell key and having a bent end to engage the slot in each key boss.

4. A key construction as claimed in claim 1, 2 or 3, wherein each shell key is substantially U-shaped in cross section and is slidably received by each key boss along its entire length thereof.

5. A key construction as claimed in any of the preceding claims, including at least one steel brake disc having corresponding openings therein to receive each key boss and its covering shell key.

6. A key construction for splining steel brake discs to an annular wheel of light weight metal substantially as described with reference to the accompanying drawings.

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Chartered Patent Agents,  
Agents for the Applicants.

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COMPLETE SPECIFICATION

1 SHEET

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the Original on a reduced scale*

FIG.1

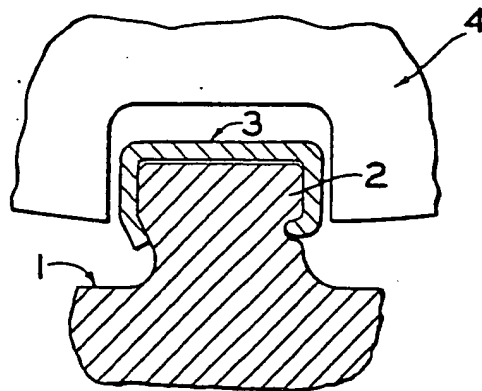


FIG. 2

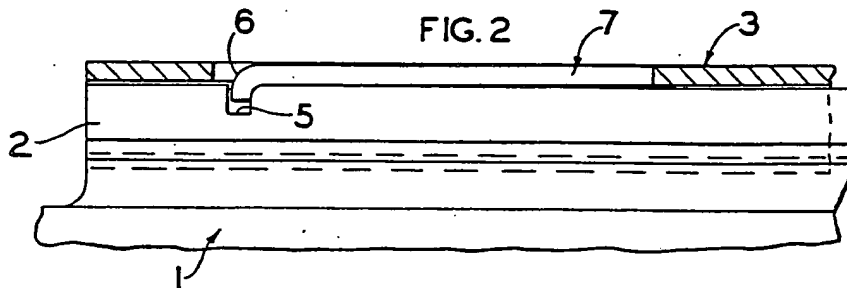


FIG. 3

